Features of the social and built environment that contribute to the well-being of people with dementia who live at home

Sturge, Jodi; Nordin, Susanna ; Sussana Patil, Divya ; Jones, Allyson; Légaré, France; Elf, Marie; Meijering, Louise

Published in:
Health & Place

DOI:
10.1016/j.healthplace.2020.102483

Publication date:
2021

Health & Place 67 (2021) 102483

Contents lists available at ScienceDirect

Health and Place

journal homepage: http://www.elsevier.com/locate/healthplace

Features of the social and built environment that contribute to the well-being of people with dementia who live at home: A scoping review☆

Jodi Sturge [a,*], Susanna Nordin [b], Divya Sussana Patil [c], Allyson Jones [d], France Légaré [e], Marie Elf [b], Louise Meijering [a]

[a] Population Research Centre, Faculty of Spatial Sciences, University of Groningen, Netherlands
[b] School of Education, Health and Social Studies, Dalarna University, Falun, Sweden
[c] Transdisciplinary Centre for Qualitative Methods, Department of Health Information, Prasanna School of Public Health (PSPH), Manipal Academy of Higher Education (MAHE), Manipal, India
[d] Faculty of Rehabilitation Medicine, University of Alberta, Edmonton, Canada
[e] Centre De Recherche Sur Les soins et Les Services de Première Ligne de S'Université Laval (CERSSPL-UL), Department of Family Medicine and Emergency Medicine, Université Laval, Canada

ARTICLE INFO

Keywords:
Dementia-friendly communities
Lived experience
Outdoor environment
Scoping review
Well-being

ABSTRACT

This scoping review summarizes findings from 23 qualitative articles on how social and built environments contribute to the well-being of people with dementia who live at home. Through thematic analysis, two themes were identified: i) connection to society and supportive relationships and ii) interaction with natural environments and public space. Features of the social and built environment contribute to well-being both positively and negatively. Future research should explore how these features intersect in an urban-rural context as a basis to inform the development of dementia-friendly initiatives. Moreover, involving people with dementia in the design of features of built environments, such as infrastructure, will result in more inclusive communities.

1. Introduction

As the population ages, more people with dementia will live at home and less will be cared for in institutional settings (Ansah et al., 2017; Macdonald and Cooper, 2007). Dementia is a syndrome connected with deterioration in memory, thinking, behavior and the ability to perform everyday activities (WHO, 2018). Alzheimer's disease is the most common type of dementia, accounting for approximately 80% of cases (Alzheimer's Association, 2019). The probability of developing all types of dementia increases with age from 1% at age 60 to 40% at age 85 (Bolla et al., 2000). However, the prevalence rate is likely underestimated where many people who experience dementia-related symptoms may never receive a formal diagnosis (Prince et al., 2013). Cognitive, emotional and physical symptoms of dementia are diverse and often intensify as the disease progresses. In most cases, people in the early stages of dementia can function independently with some assistance, but as the disease progresses, they often require more support with their activities of daily living (Dua et al., 2017).

Globally, most people with dementia live at home (Alzheimer's Disease International, 2018). People with dementia are no different than people without dementia where they want to remain at home as long as possible, with a sense of familiarity, and engagement in typical everyday activities (Han et al., 2016; Rapaport et al., 2020; van der Roest et al., 2009). Before the onset of dementia, a person may have indicated their housing preference (Garvelink et al., 2016; Hadjri et al., 2015). To remain at home, a supportive and safe environment is crucial. Behavioral and cognitive changes coupled with deteriorating mobility can be mitigated with supportive environmental features that preserve or optimize independence (Calkins, 2018; van Hoof, 2010). For an environment to be considered dementia-friendly, both the social and built environments must have supportive features to allow people with dementia to live well (Courtney-Pratt et al., 2018; Davis et al., 2009; Lin and Lewis, 2015). Therefore, the core concepts for this review are dementia-friendly, social environment, built environment and well-being (see Table 1).

As more people with dementia age in a community setting, dementia-

☆ This publication is a part of the COORDINATEs study (project number: 9003037412) which is funded by the Joint Programming Initiative More Years, Better Lives, represented by ZonMw in the Netherlands.

* Corresponding author.
E-mail address: j.l.sturge@rug.nl (J. Sturge).

https://doi.org/10.1016/j.healthplace.2020.102483
Received 21 August 2020; Received in revised form 11 November 2020; Accepted 12 November 2020
Available online 27 November 2020

Table 1
Key concepts and definitions.

TERM	DEFINITION
Dementia-friendly	"A cohesive system of support that recognizes the experiences of the person with dementia and best provides assistance for the person to remain engaged in everyday life in a meaningful way" (Davis et al., 2009, p.187; p.187)
Built environment	The physical structures and elements of the human made environments in which we live, work, travel, and play. Such environments include houses, parks, streets, shopping centers, and transit stations (Frank and Engelke, 2005)
Social environment	Locally situated relationships and contact with family, friends and the general public (Odzakovic et al., 2019)
Well-being	The balance between resources and challenges that can be affected by life events. Well-being is stabilized when individuals have psychological, social and physical resources to offset challenges. (Dodge et al., 2012)

friendly initiatives are being implemented to improve their quality of life. Communities, which consist of both social and built features, can become dementia-friendly by adapting practices, such as providing person-centered care, dementia awareness education and implementing environmental design principles. Such practices can enhance the quality of life for people with dementia (Hebert and Scales, 2017). To ensure that dementia-friendly communities empower and meet the needs of people with dementia, a best practice is to include the perceptions of individuals with dementia who live at home as a basis to develop effective programs and policy (Han et al., 2016; Morrisby et al., 2018; Wiersma et al., 2016). To this end, community-led initiatives such as workshops or community forums, can identify the structural elements of a community which can be mobilized to create a dementia-friendly community (Courtney-Pratt et al., 2018). Such structural elements may include community cohesion and local health services.

The well-being of people with dementia can be positively influenced through environmental design (Day et al., 2000). There is extensive research on how design interventions in both long-term care and home environments, such as layout and access to outdoor and social spaces, impact the level of engagement and well-being of people with dementia (Chaudhury et al., 2018; Cohen-Mansfield et al., 2011; Motealleh et al., 2019; Soilemezi et al., 2019). However, the impact of dementia-friendly environmental design on the quality of life, improved functioning or well-being of people with dementia, has yet to be fully evaluated (Hebert and Scales, 2017; Shah et al., 2016). Further, there is critique that dementia-friendly initiatives tend to focus on attributes of the built environment, as opposed to the social environment, and guidelines used to measure the environment are based on institutional research and not applicable to community-settings (Førsund et al., 2018; Hebert and Scales, 2017; Lin and Lewis, 2015). Despite the crucial role that social and built environments play in dementia-friendly initiatives, there is a gap in the literature in understanding the impact of these features on well-being, from the perspectives of people living with dementia (Hebert and Scales, 2017). Therefore, the purpose of this scoping review is to summarize and identify gaps what is known about how people with dementia who live at home perceive the social and built environment, outside the home, and how features of these environments contribute to their well-being.

2. Methods

The scoping review method used for this article is based on the framework developed by Arksey and O'Malley (2005). This five-stage iterative approach is suited to mapping broad topics and a variety of study designs to clarify key concepts and identify gaps. This method is appropriate for dementia research where the research is wide-ranging and multi-disciplinary. A scoping review identifies gaps in the research with a range of study designs and beyond studies related to intervention effectiveness (Levac et al., 2010; Peters et al., 2015). To ensure the quality of this review, we referred to the methodological guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) (Appendix 1) (Tricco et al., 2018). A protocol for this review has not been registered.

2.1. Research question

The research question guiding this review is "How do people with dementia who live at home perceive the features of the social and built environment, outside the home, and how do these environments contribute to their well-being?"

The articles selected for review had to meet the following inclusion criteria:

i) people with dementia were the target population of the study;
ii) the perceptions of people living with dementia were included;
iii) described a social and/or built environment in a community setting;
iv) peer-reviewed with no limits on the type of study (editorials and commentaries were excluded);
v) published in English.

To ensure that the perceptions of the people with dementia were captured in an ethical manner, only peer-reviewed literature was considered. This is based on the assumption that all published research would have met ethical standards. Articles were excluded if the research was conducted in a medical or long-term care setting or if the focus was on people with a broader category of diseases, such as chronic conditions or mental health or disabilities.

2.2. Search strategy and study selection

The literature search was conducted by one of the authors (DSP) using the following electronic databases: Scopus, PubMed, PsycINFO, and Web of Science. We searched for empirical, peer-reviewed articles published between January 2005 and May 2019. The search strategy was based on a combination of terms, using Boolean operators 'AND' and 'OR' (see Appendix 2). Additional searches were made by citation chaining. Citation alerts and Google Scholar alerts, based on the key words, were also used to update the search until March 2020.

The initial electronic database search identified 955 citations which were merged into a common Excel file. Duplicates were removed, resulting in 696 unique citations. The titles and abstracts were initially screened by the first author and further assessed by an additional author (LM) resulting in 11 articles which met the inclusion criteria. Additionally, 14 articles were identified through a citation chaining process and four more by citation alerts. A full text review of these 29 articles resulted in a shortlist of 23 articles. As recommended by Levac et al. (2010), the first five articles of the shortlist were further screened by the second author (SN) to confirm that the selected articles were consistent with the research question. Fig. 1 summarizes the search and selection process.

2.3. Data extraction and analysis

The first author assessed the selected articles and charted in Excel with information on: lead author, year, location, research aim, methodology, sample description and main findings.

We present the findings of this scoping review in two ways. First, a summary of the study characteristics of the articles according to the year of publication, research location, sample size and age range plus participant eligibility criteria. Second, we used a thematic approach, as detailed by Green and Thorogood (2004), to analyze the findings and results of the selected articles, which we then present in a narrative account. For the articles that concerned with a mix of research

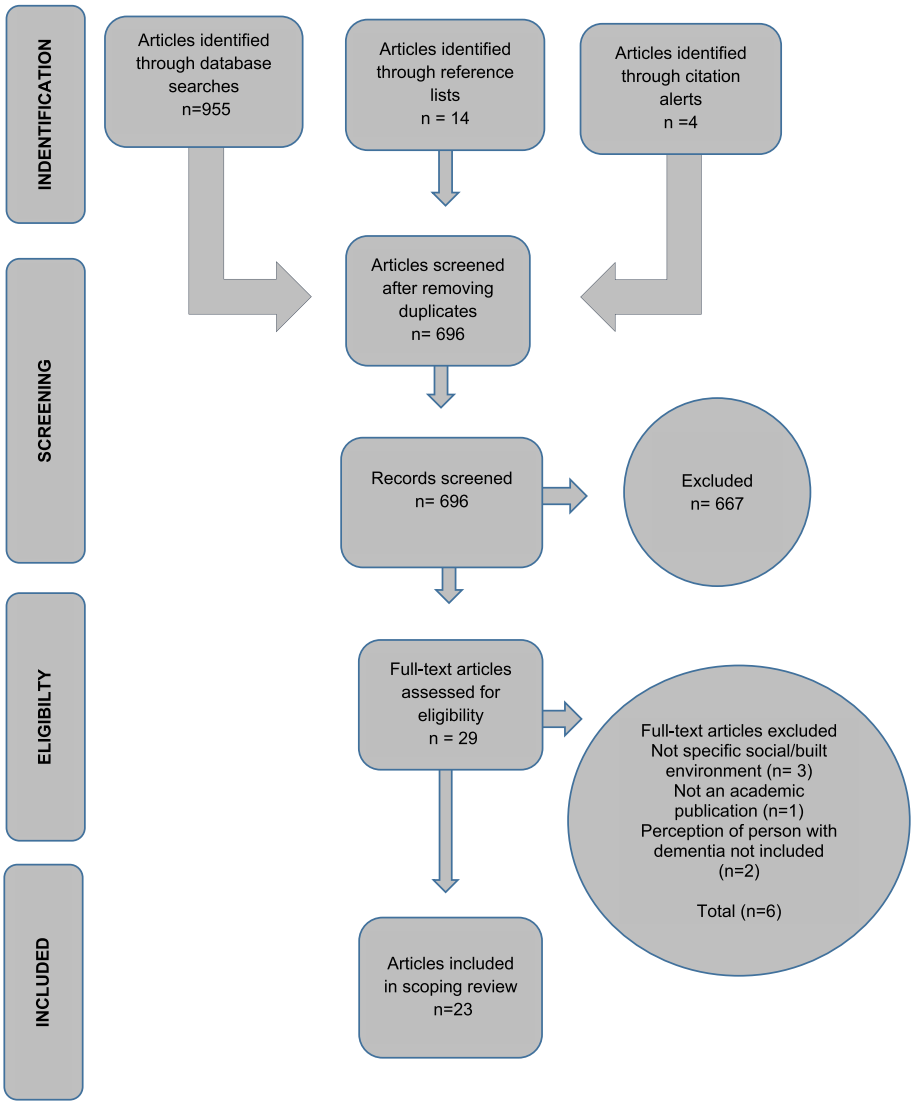

Fig. 1. PRISMA flow diagram of search and study selection (adapted from Moher et al., 2009).

participants (e.g., caregivers), only the data collected from those with dementia were included in the analysis. The first author carried out a thematic analysis with the use of Atlas.ti (8.4.24) software. An open coding scheme was used to generate codes which were further organized into themes and sub-themes. The second author also coded the first five articles to validate the themes and sub-themes. Differences were discussed and resolved among the authors.

3. Results

3.1. Characteristics of the included articles

We identified twenty-three qualitative articles for inclusion in this review (Table 2). Although published between 2006 and 2020, more than half (n = 14) were published between 2016 and 2020. The majority of the articles were from the UK (n = 8) and Sweden (n = 7). Four publications were based on the "Neighborhoods: Our people, our places" project, a longitudinal and comparative study in two sites in the UK and one in Sweden (#7, #16, #17, #22). The majority of the included articles used semi-structured interviews, walking interviews and focus groups. The sample size ranged from six to 67 participants. Their age of ranged between 48 years and 95 years, with the majority of the participants being between 60 years and 89 years old. Eight articles included participants under the age of 60 and two articles included participants over 90. All studies involved people with dementia, the eligibility criteria however, related to the type of diagnosis varied. The majority of the studies had inclusion criteria pertaining to a diagnosis of dementia. Impaired cognition was assessed with clinical tools such as the Mini-Mental State Examination (MMSE) in six of the studies (#2, #6, #10, #13, #14, #15). Other studies had less stringent eligibility criteria and included those experiencing memory problems related to an illness (#20) or participants who chose not to, or were unable to, reveal the type of dementia that they had (#7, #16, #17, #22). Recruiting participants based on experiencing memory issues is an inclusive approach to dementia research: the results reflect a range of experiences related to dementia-related symptoms, not necessarily a formal diagnosis (Hellström et al., 2007; Michalowsky et al., 2016; Novek and Wilkinson, 2017; Sturge et al., 2020).

3.2. Perceptions of people with dementia

The thematic analysis resulted in two main themes and several subthemes relating to the influence of the social and built environment on well-being. Table 3 provides an overview of the results from the thematic analysis.

Theme 1. Connection to society and supportive relationships

Table 2
Characteristics of the included articles.

Lead author (year) Study Location	Research Aim	Methodology	Research Participants (sample size)	Age Range of Participants with Dementia	Main Findings
Bartlett et al. (2019) United Kingdom (#1)	To understand how vulnerability is experienced and dealt with by people with dementia when outdoors	Mixed-method: • Walking interviews • Sit down interview	• Individuals with dementia (n=16) • Family members (n=16) • Police (n=20)	55 – 85 years	People with dementia can experience vulnerability in themselves, in public and with their family. Vulnerability was characterized by an awareness of failing knowledge about oneself or the 'rules 'of outdoor life.
Blackman et al. (2007) United Kingdom (#2)	To evaluate how outdoor environments may disable people with dementia using the validity and reliability of virtual reality (VR) technology to produce findings or recommendations for physical planning and dementia-design practice	Mixed-method: • Real world walking interviews • VR walking interviews	Individuals with a diagnosis of mild to moderate dementia confirmed by a MMSE score (n=38)	71 – 84 years	Based on a real town walk and a virtual reality walk (with adaptations made to stimulate design improvements), people with dementia experience few obstacles in town centers. Participants report crossing streets to be safe and street furniture identifiable. There are measurable benefits in using textual signs to support wayfinding and to identify objects and places in the environment.
Brittain et al. (2010) United Kingdom (#3)	To explore the meanings and lived experiences of older people with dementia, in relation to everyday technologies in public spaces to support people with dementia to carry on with their everyday outside activities	Focus groups	Individuals with dementia (n=16) Caregivers (n=3)	Not specified	People with dementia enjoy engaging in public space; however, public spaces can be both therapeutic and intimidating, especially unfamiliar areas. People with dementia can feel out of place in public space but can use everyday technologies to manage this feeling.
Brorsson et al. (2018) Sweden (#4)	To identify and examine characteristics of the space in a grocery shop that may influence how its accessibility is perceived by people with dementia	Mixed-method: • Focus groups • Photo documentation	Individuals diagnosed with early Alzheimer-type dementia (n=6)	57 – 70 years	Four features of grocery shops that can influence accessibility include 1) illogical arrangement of goods and services, 2) an overload of products, information and people, 3) visual illusions and 4) intrusive auditory stimuli.
Brorsson et al. (2016) Sweden (#5)	To identify problematic situations when using zebra crossings and understand how people with dementia would understand, interpret and act in these situations	Mixed-method: • Focus groups • Film sequences	Individuals diagnosed with dementia (n=6)	66 – 86 years	People with dementia tend to avoid problematic traffic situations by relying on traffic lights, following the flow of pedestrians and exercising caution at a crossing
Brorsson et al. (2011) Sweden (#6)	To illuminate experiences of accessibility in public spaces in people with AD with a focus on places, situations and activities that they find important for daily life	Focus groups	Individuals diagnosed with early Alzheimer-type dementia by a physician based on NINCDS-ADRDA (n=6)	64 – 80 years	Public spaces are more accessible for people with dementia when they are familiar with and comfortable in those spaces and when activities are tailored to their motives and interests. People with dementia can plan and have strategies in place to protect them from feeling tired or unsafe. Changes in places and problematic situations, everyday technologies, crowded places and changes in landmarks can be barriers to accessing public space.
Clark et al. (2020) United Kingdom and Sweden (#7)	To contribute to a new understanding about the relevance of local places for supporting people living with dementia in the community.	Mixed-method: • Social network maps • Walking interviews • Home tours	Individuals with dementia (n=67) Caregivers (n=62)	51 – 88 years	Neighborhoods provide practical support for people with dementia through public amenities relationship interactions and a network of support. Neighborhoods are sites for connection, interaction and social engagement for people living with dementia.
Clarke and Bailey (2016) United Kingdom (#8)	To explore the everyday experiences of living with dementia within rural and semi-urban communities	Mixed-method: • Diaries • Interviews	Individuals with a dementia diagnosis confirmed by a physician (n=13) Spouse and caregiver (n=13) Service providers and commissionaires (n=6)	Mid 60 – early 90 years	Familiarity with people and places can be supportive and these factors support narrative citizenship in which people can tell a story of inclusion and feeling on the inside. Familiarity may also cause a social barrier and a sense of estrangement, or being on the outside.
De Witt et al. (2009)	To understand the experiences of living alone with a dementia diagnosis	Open-ended interviews	Women with mild to moderate Alzheimer's disease (Stages 4 and 5) assessed by a Functional	58 – 87 years	Study findings deepen understanding of 'space' and 'place' in the experience of living alone with

(*continued on next page*)

Table 2 (*continued*)

Lead author (year) Study Location	Research Aim	Methodology	Research Participants (sample size)	Age Range of Participants with Dementia	Main Findings
Canada (#9)			Assessment Staging system (FAST) (n=8)		dementia. Participants seek the middle-ground of dialectical tensions within the threshold space and shared insights about their spatial experience of a) being here, b) being there, c) being out and, keeping out. Participants risked losing their threshold space when admitting to mistakes as their illness progresses.
Duggan et al. (2008) United Kingdom (#10)	To explore how people with dementia use the outdoor environment and the impact of dementia on how they experience the outdoor environment	Semi-structured interviews	Individuals with mild to moderate dementia confirmed by a MMSE score (n=22) Caregivers (n=14)	71 – 84 years	Three themes highlight the impact of early dementia on a person's life: 1) the outdoor world provides important opportunities for activities and interactions, 2) most people with dementia did not think that their experiences with the outdoor environment had changed since their diagnosis and 3) accessing familiar environments.
Gibson et al. (2013) United Kingdom (#11)	To investigate enabling environments for people with dementia focusing on well-being and quality of life.	Mixed-method: • Semi-structured interviews • Focus groups	Individuals with a dementia diagnosis of any type (n=26) Caregivers (n=23) Service professionals (n=18)	Not specified	Having a connection to nature, access to the outdoors and participation in nature-based activities are enjoyable and contribute to the well-being of people with dementia.
Lloyd and Stirling (2015) Australia (#12)	To gain a deeper understanding of the everyday lives and unmet service needs of people with dementia who live alone.	Semi-structured interviews	Individuals with early to moderate dementia	48 – 85 years	The study identifies four salient factors: 1) access to public space, 2) social distance and proximity, 3) changing meanings of space and object, 4) imaginative co-presence.
Mitchell and Burton, (2006) United Kingdom (#13)	To investigate how local neighborhoods can be designed or adapted so that people with dementia can continue to use them, thereby enhancing their quality of life.	Mixed-method: • Semi-structured interviews • Walking interviews • Research instruments with design features of the neighborhood	Individuals with of mild to moderate dementia confirmed by a MMSE score (n=20) Individuals without dementia as a control group (n=25)	60 years and older	People with dementia regularly go out alone but can become disoriented in busy places. Preferred locations for people with dementia include shops, post offices and parks. They tend to avoid socially demanding situations. Some built features can be useful landmarks, while others can cause disorientation.
Öhman et al. (2008) Sweden (#14)	To explore how the awareness of people with Alzheimer's disease may show itself in the context of everyday occupations	Semi-structured interviews	Individuals with of mild to moderate degree of Alzheimer's disease according to DSM-IV and NINCDS-ADRDA criteria (n=6)	65 – 80 years	Participants have an awareness of the consequences of having Alzheimer's disease (AD). In comparison to their lives before AD, participants noticed changes in occupational and social interactions and reflecting on the consequences and changes in life situations.
Olsson et al. (2013) Sweden (#15)	To describe the reflections of persons with early-stage dementia about being outdoors	In-depth interviews	Individuals with of early stage dementia confirmed by a MMSE score (n=11)	52– 81 years	Being outdoors provides a sense of self. There are barriers to being outdoors, but people with dementia can use adaptive strategies.
Odzakovic et al. (2019) Sweden and United Kingdom (#16)	To explore the experiences of people living alone with dementia and how they maintain their social networks and connections	Mixed-method: • Social network maps • Walking interviews • Home tours	Individuals with dementia (n=14)	62– 88 years	People living at home with dementia can manage their social connections in four ways: making an effort to stay connected, making friendships at events facilitated by service providers, a quiet neighborhood atmosphere and dealing with changes in social connections.
Odzakovic et al.(2018) Sweden (#17)	To explore how community-dwellers with dementia use and interact with their neighborhood in order to undercover new knowledge about everyday life with dementia.	Walking interviews	Individuals with dementia (n=14)	62– 87 years	For people with dementia who live at home, neighborhoods provide a sense of attachment and space to move freely. Four themes are identified through the interviews, 1) Life narratives embedded in the neighborhood; 2) the support of selfhood and well-being through movement; 3) the neighborhood as an immediate social context and 4) restorative connections to nature.
Sandberg et al. (2017) Sweden (#18)	To explore and better understand how people with dementia, living at home,	Open-ended interviews	Individuals diagnosed with mild to moderate dementia (n=12)	67– 87 years	People with dementia experience risk when a situation is unfamiliar or confusing. To reduce risk, participants report seeking out

(*continued on next page*)

Table 2 (*continued*)

Lead author (year) Study Location	Research Aim	Methodology	Research Participants (sample size)	Age Range of Participants with Dementia	Main Findings
	experience risks in their daily life and how they handle these situations				something recognizable, convincing oneself that the situation is safe, refraining from exposing oneself to situations of risk, and accepting assistance.
Sheehan et al. (2006) United Kingdom (#19)	To investigate outdoor wayfinding performance of people with dementia and identify which features of the outdoor built environment are used for wayfinding by people with dementia.	Walking interviews	Individuals diagnosed with mild to moderate dementia (n=13) Individuals without dementia as a control group (n=10)	70– 87 years	Compared to a group of older adults without dementia, people with dementia have more difficulty finding their way. Features of the built environment, such as signs, are useful in wayfinding.
Smith et al. (2016) New Zealand (#20)	To gain insights from people living with dementia about their needs in post-quake communities	Semi-structured interviews	Self-identify as having memory and orientation problems with a dementing illness (n=26)	60 – 95 years	People with dementia find it important to be engaged in community and social life and to have access to leisure activities. Also, people with dementia want to feel understood by services and businesses that are dementia-informed.
Tranvåg et al (2015) Norway (#21)	To explore the qualities of relational interactions that preserve dignity in experiences of people with dementia	Semi-structured interviews	Individuals diagnosed with mild to moderate dementia (n=11)	64 – 85 years	For people with dementia to preserve their dignity, they must experience love and confirmation, experience and social inclusion, experience understanding within a caring culture, and they must be treated as a human being.
Ward et al., (2018) United Kingdom (#22)	To demonstrate the contribution of social engagement and environmental support to the social health of people living with dementia	Mixed-method: • Social network maps • Walking interviews • Home tours	Individuals with dementia (n=16) Caregivers (n=6)	60 – 85 years	Neighborhoods provide opportunities, help and support for people who live at home with dementia.
Wu et al. (2019) Taiwan (#23)	To identify the indicators of dementia-friendly communities and their current conditions in Taiwan from the perspectives of people with dementia and dementia-family caregivers.	Face-to-face interviews	Individuals diagnosed with mild to moderate dementia (n=16) Caregivers (n=20)	54 – 85 years	Eight dementia-friendly (DF) indicators are: 1) DF care services, 2) DF hospitals, 3) DF communities, 4) DF transportation, 5) DF stores and shops, 6) DF community members, 7) Integrated dementia-related information, and 8) opportunities for people with dementia to contribute to the community.

Table 3
Results of the thematic analysis.

Main theme	Sub-theme: Contributors to well-being
Theme 1: Connection to society and supportive relationships	Friends and family
	Formalized activities and professional support
	Social interactions in the neighborhood
Theme 2: Interaction with natural environments and public space	Disclosure and public awareness
	Engagement with natural environments
	Access to public space
	Public space features: a) Streets and traffic b) Noise c) Landmarks d) Signage
	Changes in landscape, design and technology
	Neighborhoods, the intersection of the social and built environment

Friends and family

Seventeen papers in this review describe the supportive role of friends and family (#1, #2, #3, #6, #7, #8, #10, #11, #13, #12, #14, #15, #16, #17, #21, #22, #23). Spending quality time with friends and family is important for people with dementia (#21) and some rely on this type of support to motivate them to get out of the house (#3, #23) or to drive them to places (#8). Some people with dementia report losing friends or having less contact with family after receiving a dementia diagnosis while others state that relations with friends, family and neighbors continued after the diagnosis (#8, #16, #21). According to Clark et al. (2020) (#7), it is less about the size of a person's social network but more about the quality and capacity to provide support that matters. Also related to the quality of relationships, some articles highlight the importance of being needed and trusted by others (#14, #23) plus the importance of reciprocal relationships (#7, #22).

Formalized activities and professional support

Some participants, achieve social inclusion by being involved in an active social network or attending formalized activities at senior centers (#21, #23) and cultural centers (#11, #17) or peer-support activities (#20). Others find social situations awkward and, in turn, avoid them (#8, #9), or avoid activities that are too overwhelming due to crowds and noise (#20). Healthcare professionals can also play a key role in the lives of people living with dementia at home by providing support and information, and promoting autonomy and a sense of friendship (#2, #8, #11, #21).

Social interaction in the neighborhood

Interactions with people in a neighborhood can provide a sense of security and belonging for people with dementia who live at home

(#22). Fifteen articles mention neighbors as actors in the lives of people with dementia (#1, #6, #7, #8, #10, #11, #12, #13, #14, #16, #17, #18, #20, #22, #23). The role that neighbors played in the lives of people with dementia varies. For some, neighbors played an active role, such as by keeping a watchful eye or providing emotional support (#7, #16, #22) while others experience people in the community as unfriendly (#23) and are cautious of their neighbors and have limited encounters with them (#12, #17). In several articles, participants described going out for a walk as a common way to stay fit and also to engage with people in their neighborhood (#1, #10, #12, #14). Some people purposely walk or sit on a bench in a public space for a chance encounter to chat with a stranger (#10, #12, #17) while others rely on strangers to help them navigate their way back home (#1, #3, #15). 'Familiar strangers' (#7; p. 13) are people within the neighborhood with whom people with dementia have regular encounters. However, they may not necessarily know the names or details of these strangers. Having regular interaction with these "familiar strangers" and familiar faces provides a sense of belonging for people with dementia (#3, #10, #22). As shown in the preceding, some people are wary of strangers while for others, strangers provide chance encounters and over time they may become more familiar which can possibly lead to friendship.

Going to places such as museums (#6), pubs and cafes (#16, #17) and libraries (#8) provides connection to the outside world. Shops are locations that are the most visited by people with dementia who live at home (#2, #9, #13). Participants describe visiting shops, sometimes on a daily basis, which gives them a connection to society and also opportunities for social interaction with staff (#7, #22). For instance, in the Blackman et al. (2007) (#2) study, participants preferred shopping areas that were bright and spacious shopping areas with plenty of seats but with not too many people. People with dementia can also feel vulnerable in shops when making payments, where it may be unclear how to pay, they forget their pin number or miscount money at the till (#1, #4, #14, #18). These situations can make people with dementia feel like they are revealing their health condition is being exposed to strangers against their will, which can make them feel unsafe and vulnerable: they fear that others may steal from them or see their pin code written somewhere, a strategy they use to cope with their condition (#4, #18).

Disclosure and public awareness

Several papers describe the importance of disclosure and public awareness. In five articles, participants described a sense of comfort after telling others, on their own terms, about their dementia diagnosis (#1, #9, #14, #18, #22). Some feel that disclosing their diagnosis to strangers is a way to make them aware that that dementia is in the community (#7, #22). In the study by Smith et al. (2016) (#20) study, a participant describes how customer service improved after disclosing their diagnosis to a shopkeeper. Others have mixed feelings about disclosing their dementia diagnosis, commenting that they feel embarrassed about it and that telling people about their dementia poses a risk of not being allowed to continue living at home or that disclosure leads them feeling socially excluded, exposed or threatened (#3, #8, #9, #18). Smith et al. (2016) (#20) report another participant who felt that if his former workplace had been educated about dementia, and had implemented support strategies, he could have remained in employment. The importance of public dementia education programs is highlighted in four articles (#7, #17, #20, #23).

Theme 2. Interaction with natural environments and public space

Engagement with natural environments

For people living at home with dementia, having access to natural environments is important for their emotional and spiritual well-being (#11) and it provides a sense of freedom, independence and being a part of society (#6, #12, #20, #21). Features in the built environment which provide access to natural areas such as parks and walkways can encourage people living with dementia to get outside (#10, #11, #13, #15, #16, #17). Housing features, such as windows, balconies and doorways, present a connection to the outdoor environment in addition to opportunities to observe, and engage with the social environment (#7, #9, #12 #16, #17, #22). Regardless of whether a person with dementia is walking outside or sitting in on their balcony, access to nature (e.g., fresh air, the beach, sunlight, flowers, plants and animals) is described as essential for overall well-being by several articles (#1, #2, #9, #10, #11, #12, #13, #15, #16, #17, #19, #20, #22).

Access to public space

A number of articles find that public spaces are more accessible to people with dementia when they themselves are familiar with such spaces (#3, #6, #8, #10, #13, #15, #20) and when activities meet their needs or provide opportunities for participation (#6, #8, #16, #21, #23). Engaging in public space, such as using public transportation, can provide a sense of independence although these activities can be intimidating and stressful when users transition from one location to another and when they face difficulties (e.g., crowded and bustling places) (#5, #6, #9, #13, #18, #23). Eight articles describe people engaging in morning activities (#3, #4, #6, #7, #14, #16, #17, #20) such as going for a walk (#3, #17), shopping (#6) or going to a cafe (#16). However, with regard to late afternoon or evening activities, people are less likely to go out alone and more likely to rely on others (#1, #6, #22). Some people reported feeling out of place and anxious in public spaces (#3, #8, #23) where they fear being targeted in a crime (#1, #4, #20). Others experience difficulty finding their way home (#12, #15). In other situations, the family may be anxious about where the person with dementia is, which in turn may affect the confidence of a person with dementia (#1, #10, #3).

Public space features

a) *Streets and traffic*

Ten articles describe streets and traffic as features of the a built environment that people with dementia have trouble navigating (#1, #2, #5, #6, #12, #13, #17, #18, #19, #20). Some of the issues with streets include knowing which way to look when attempting to cross the road, navigating complicated street networks, identifying where a street begins or ends or navigating areas several connecting streets (e.g., a four-way junction or cul-de-sacs) (#5, #13, #18). Busy traffic, crowds of pedestrians, cars parked on the pavement, the poor condition of streets and sidewalks and poorly lit streets influence how well a person with dementia navigates public space (#2, #5, #12, #19). People with dementia typically prefer areas where traffic is limited and pedestrian crossings are clearly marked, timed and controlled with traffic lights (#2, #4, #17, #19, #20). In the Brorsson et al. (2016) (#5) study, people with dementia follow the flow of pedestrian traffic as a coping strategy to feel secure when crossing a street.

b) *Noise*

Noise in public space can be a positive or negative sensory experience. For people with dementia, the sound of children playing, birds singing, or listening to the sea can be a positive experience (#15). In addition, noise can be a helpful audible cue at a pedestrian crossing (#13) or listening for railway or highway sounds to help navigate their way home (#15). In other articles, noise from the traffic, pop music or screaming children is a negative factor that can cause stress (#4, #13) The absence of sound, for instance when places become less populated, can cause a sense of insecurity (#16).

c) *Landmarks*

Ten articles describe situations when people with dementia lose their way (#1, #3, #6, #8, #10, #13, #14, #18, #19, #22). To manage these "time-consuming misadventures" (#14: p. 47) some participants state that they are no longer tempted to roam and prefer to carry out activities in familiar spaces, such as the neighborhoods where they live (#6). Dominant features of a landscape, such as church steeples and buildings, are used for orientation. Smaller features, such as signage, street furniture and post boxes, are useful establishing their location. Other features, such as looped walking paths, can be reassuring where such paths bring people back to where they started (#15). Relying on landmarks as a means to find their way is a common coping strategy for people with dementia (#1, #2, #3, #5, #6, #13, #15, #18, #19).

d) *Signage*

Signage, a public space feature that people with dementia rely on, is discussed in eight articles (#2, #3, #6, #10, #13, #19, #20, #23). Some participants describe situations where signs, maps and bus timetables are difficult to interpret. In some cases, they are able to read the signs; however, they are unable to understand the purpose of the sign or locate their position on a map (#6, #18). In other situations, such as road works, participants described situations where they are unable to discern whether a sign was in place to control car traffic or pedestrians. These participants suggest clear signage to help people navigate the site properly (#2, #20). To ensure that signage is useful for people with dementia, Blackman et al. (2007) (#2) suggest that the design features should be clearly explained with simple text (e.g., bus station) rather than with photographs and symbols.

Changes in landscapes, design and technology

Changes in the built environment can negatively influence how people navigate and enjoy outdoor spaces. When a distinct landmark is removed or a landscape is modified, for example the reconstruction of a well-known site (#6, #12), this may cause confusion for some people with dementia (#8, #15). Confusion can also occur when the function of buildings change (e.g., office space being reconstructed as housing) (#17), when modern buildings are developed without a clear function or without indications such as the location of entrances (#2, #13). In addition, housing developments with uniform and similar structures can make it difficult for people with dementia to identify landmarks (#1, #13). When moving to a new home, the unfamiliar surrounding environment can be unfamiliar which in turn can cause a person with dementia to become disoriented in time and place (#3).

There is a trend toward larger grocery stores carrying a variety of products. According to Brorsson et al. (2018) (#4), people with dementia prefer small stores with spacious, organized layouts. In their study, participants described feeling overwhelmed by an overload of products on the shelves and are confused by some of the modern glass features in grocery stores. For example, they found themselves trying to pick vegetables from a mirror in the vegetable stand or walking into glass doors at the entrance.

Technology can be useful for people with dementia when they interact with public space. Devices such as cell phones and tracking technology can provide a sense of security (#1, #3, #15). However, people with dementia may perceive some technology in public spaces negatively (#1). For instance, when walking in public space some people cannot hear approaching electric cars and scooters (#5). When machines replace staff in grocery stores and libraries, these machines take away an often welcomed social encounter (#6). In such circumstances, people with dementia can be stressed by the different stages of a process (e.g., scanning, bagging, payment). Sometimes the technology in place is not intuitive, making it difficult to use (#4, #6).

Neighborhoods, the intersection of the social and built environment

The intersection between the social and built environment is emphasized in four articles that explore the supportive role neighborhoods play in the day-to-day lives of people affected by dementia (#7, #16, #17, #22). Neighborhoods can have several supportive built environmental features that facilitate the mobility of people with dementia such as well-maintained streets and sidewalks, clear signage, and traffic control measures. Further, the social environment in neighborhoods can be enhanced with opportunities for interaction, activity centers, green spaces and shops. Other features of a neighborhood that impact well-being can be difficult to contextualize, such as a feeling of safety and security. For instance, a quiet neighborhood atmosphere can cause a person with dementia to feel insecure and affect their well-being (#16).

4. Discussion

This scoping review summarizes research findings on how people with dementia perceive features of social and built environment and how interaction with these features contribute to the well-being of people with dementia who live at home. From our review of 23 qualitative articles, we identified two themes i) connection to society and supportive relationships and ii) interaction with natural environments and public space. Despite challenges associated with dementia, access to social and built environments contributes positively to the well-being of people with dementia who live at home (#10, #16). However, when individuals experience stress and challenges within these environments, these interactions can negatively impact well-being. These observations resonate with the definition of well-being: when there is a balance between resources and challenges, positive functioning and psychological health improves (Clare et al., 2019; Clarke et al., 2020; Dodge et al., 2012). As we have outlined in the results, there is no "one size fits all" solution to the question of which features of the social and built environment contribute to well-being. Some individuals may experience environmental features such as children playing, as positive but not all experience the same features similarly.

This scoping review builds upon (Keady et al., 2012), who summarizes earlier literature and identified similar themes related to outdoor space, built environment and everyday technologies that promote the independence of people who live with dementia in the neighborhood. Our review expands on Keady et al.'s (2012) through a scoping review methodological framework and an updated search of the literature, with a focus on literature that reflects the perception of a person with dementia. Our review also highlights the importance of the intersection between social and built environments. This is significant because this intersection has been found to impact older adults' well-being in general (Kabisch et al., 2017; Ottoni et al., 2016). For instance, features of the built environment such as shops, well-maintained streets and sidewalks, clear signage and traffic control measures can encourage independence and provide social interaction opportunities for people with dementia. However, built environmental features can also impact a person's sense of coherence, which can restrict mobility and directly influence social relations, health and well-being (Antonovsky, 1993; Biglieri, 2018; Evans, 2003; Hanson et al., 2013; Koster et al., 2006; Mouratidis, 2018). It is also essential to explore the intersection between the social and built environment in urban and rural settings. Individuals living in a rural environment may have fewer opportunities to interact with an accessible built environment (e.g., limited infrastructure that may be poorly maintained). However, connecting with the social environment may be easier in a rural area than an urban area because of the presence of strong networks of friends and families who can provide support services (Blackstock et al., 2006; Keating and Phillips, 2008; Wiersma and Denton, 2016). Also, individuals who live in rural environments tend to be surrounded by abundant nature. However, access to nature may be compromised without human-made features such as maintained pathways, which are more common in urbanized areas. Further research is needed to explore the urban-rural context related to social and built

environment and how they impact the well-being of people with dementia. One way to enhance dementia-friendly plans in both urban and rural settings is to consider the social environment and its impact on the social health of people with dementia. The concept of social health highlights the capabilities of a person with dementia and emphasizes the importance of social opportunities and engagement for better health and well-being, and this concept has been operationalized for people with dementia. Social health, in relation to dementia, has three dimensions which include i) fulfilling one's potential (e.g., through work, volunteer jobs), ii) managing one's life with some degree of independence (e.g., taking a walk alone) and iii) participating in social activities (e.g., meaningful activities and social interactions) (Dröes et al., 2017; Vernooij-Dassen and Jeon, 2016). Our review emphasizes the importance of public education and dementia-awareness for a better understanding of people living with dementia. Greater awareness can improve interactions with public space, mitigate stigma and enhance the social environment.

4.1. Design, policy and practice implications

Using technology in public space can be a challenge for people with dementia. According to Lindqvist et al. (2018) who found that technology can support or hinder the everyday lives of people living with cognitive impairments. Further, people with mild cognitive impairment (MCI) experience more problems using everyday technology than people without the impairment (Nygård, 2008). As businesses "advance" and increase automation to decrease the number of hired staff, this can be detrimental to a person with dementia. Understanding the experiences of people with dementia have when they use technology in public spaces, such as stores and banks, can inform dementia-friendly initiatives as well as care plans developed by professionals, such as occupational therapists (Gaber et al., 2019). It is becoming common practice to engage people with dementia during co-designing and in the development of assistive information technology (IT), housing environments and serious gaming (Anderiesen, 2017; Rodgers, 2018; Span et al., 2013; Tsekleves et al., 2020; van Hoof et al., 2015). Co-design techniques and training strategies can be further developed to explore the needs and abilities of people with dementia in the use of technology in public space. For instance, consulting with people with dementia in the design process of developing technology for customer interaction could ensure that the technology becomes intuitive for all customers.

Our review demonstrates that changes in landscape and public space design can cause disorientation for people with dementia, which has implications for planners and policy-makers who play a role in enhancing the well-being of people with dementia by linking the social and built environments (Biglieri, 2018; Ottoni et al., 2016).To ensure that the built environment is developed to accommodate the needs of people with dementia, planners should consult with local dementia groups to advise on redevelopment strategies, infrastructure and city planning (Mitchell and Burton, 2010). In addition, policy regulation and planning guidelines can reflect dementia-friendly environmental design and encourage architects to build and design in a manner that is 'dementia-friendly' (Biglieri, 2018). For example, guidelines for community plans could encourage the development of housing estates with unique design features that facilitate wayfinding or the provision of outdoor furniture as a required feature. Public art and heritage structures are valuable yet straightforward built environment features that people with dementia identify as distinct and meaningful landmarks (Seetharaman et al., 2020). Planners can also develop dementia-friendly, crime prevention initiatives that reflect principles of crime prevention through environmental design (CPTED) principles (Cozens and Love, 2015) to ensure that built environments provide a sense of safety in a community.

Although this review is specific to the experiences of people with dementia, some of these experiences, such as the value of social inclusion or difficulties navigating traffic, relate to the experiences of older people in general, which highlights the need to develop age-friendly environments that reflect the diverse needs of the older population and that enhance the 'agency' of particular groups (Buffel et al., 2012; Wiles et al., 2012). In addition, it is important to note that dementia does not just occur with older persons, and that the needs of those with dementia may differ based on their life course and progression of the disease. As highlighted by Bartlett and Brannelly (2019) (#1), people with dementia in their 50s and 60s tend to have insight into things that they can no longer do safely on their own while participants over the age of 70 are more aware that their overall health can fade at any time. Therefore, dementia-friendly initiatives should reflect the needs of a wider age range, not just older adults. As highlighted in this review, some people with dementia disclose their diagnosis to strangers, but it is essential to note that this is on their own terms. Policies should not segregate people with dementia by insisting that they are a certain age or that they disclose their illnesses to access services (e.g., dementia-specific villages and memory cafes) (Rahman and Swaffer, 2018). The ideal way to achieve this balance is to explore the diverse lived experiences of people with dementia as a basis for policy development.

4.2. Strengths and limitations

A key strength of this scoping review is the focus on literature that includes the perspective of people living with dementia instead of research informed by other people's experiences (e.g., caregivers). The scoping review framework has resulted in a systematic overview of the literature on dementia which describes how people function and interact with the social and built environment in a community setting. There are some limitations of this review. First, related to the nature of a scoping review, it is likely that not all publications were identified where the search strategy is not exhaustive, nor has the quality of the articles been assessed. Second, we focused on English, peer-reviewed literature which omits other studies which could provide a different perspective from people with dementia. Also, most of the research included in this review was conducted in affluent countries, which may limit the transferability of the findings to low and middle income countries. Where the social and built environment are dependent on a number of socio-political factors, we therefore suggest the need for further research other countries. Third, it should be noted that more than half the total number of articles were identified using search methods outside the electronic database search methods. This could be related to the search criteria not including terms such as 'outdoor life' or 'places' which are common terms in the literature. In addition, qualitative studies tend to have small samples which usually consist of people who are willing to share their experiences with a researcher, are active service users (Morrisby et al., 2018) or have the resources to participate (#21). Therefore, the evidence in this review provides insight into the experiences of people with access to outdoor environments, not those with dementia who are restricted to staying indoors. Further, the perception of those with dementia may be dependent on their caregivers. Decreasing cognitive functioning and deteriorating perceptions can pose a barrier and deter participation in research.

5. Conclusion

As more people with dementia live at home, communities will need to adapt their social and built environment to become more dementia-friendly. Understanding these environments, based on the diverse, lived experiences and perceptions of people with dementia who live at home, yields valuable insight into the features of the external social and built environments that positively and negatively affect well-being. Highlighting the ability and functioning of people with dementia provides a better understanding of their well-being. We suggest further research to explore how these environmental features impact well-being and intersect in an urban-rural context as a basis to inform the

development of dementia-friendly communities. Moreover, engaging people with dementia in planning initiatives, designing environments and technology development will result in supportive social and built environments that can improve the lives of people with dementia and foster in more inclusive communities.

Declaration of competing interest

None declared.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.healthplace.2020.102483.

References

Alzheimer's Association, 2019. Alzheimer's Dementia. https://doi.org/10.1016/j.jalz.2019.01.010.

Alzheimer's Disease International (Adi), Wimo, A., Prince, M., International, A.D., 2015. World alzheimer report 2015, the global impact of dementia. Alzheimer's Dis. Int. (ADI). https://doi.org/10.1111/j.0963-7214.2004.00293.x.

Anderiesen, H., 2017. Playful Design for Activation: Co-designing serious games for people with moderate to severe dementia to reduce apathy. TU Delft Univ. https://doi.org/10.4233/uuid:ebeef0fa-46fe-4947-86c1-c765a583770a.

Ansah, J.P., Koh, V., Qureshi, M.A., Matchar, D.B., 2017. Modeling to inform long-term care policy and planning for an aging society. In: Understanding Complex Systems. https://doi.org/10.1007/978-3-319-55774-8_7.

Antonovsky, A., 1993. The structure and properties of the sense of coherence scale. Soc. Sci. Med. https://doi.org/10.1016/0277-9536(93)90033-Z.

Arksey, H., O'Malley, L., 2005. Scoping studies: towards a methodological framework. Int. J. Soc. Res. Methodol. 8, 19–32. https://doi.org/10.1080/1364557032000119616.

Bartlett, R., Brannelly, T., 2019. On being outdoors: how people with dementia experience and deal with vulnerabilities. Soc. Sci. Med. https://doi.org/10.1016/j.socscimed.2019.05.041.

Biglieri, S., 2018. Implementing dementia-friendly land use planning: an evaluation of current literature and financial implications for greenfield development in suburban Canada. Plann. Pract. Res. https://doi.org/10.1080/02697459.2017.1379336.

Blackman, T., van Schaik, P., Martyr, A., 2007. Outdoor environments for people with dementia: an exploratory study using virtual reality. Ageing Soc. https://doi.org/10.1017/S0144686X07006253.

Blackstock, K.L., Innes, A., Cox, S., Smith, A., Mason, A., 2006. Living with dementia in rural and remote Scotland: diverse experiences of people with dementia and their carers. J. Rural Stud. https://doi.org/10.1016/j.jrurstud.2005.08.007.

Bolla, L.R., Filley, C.M., Palmer, R.M., 2000. Dementia DDx: Office Diagnosis of the Four Major Types of Dementia. Geriatrics.

Brittain, K., Corner, L., Robinson, L., Bond, J., 2010. Ageing in place and technologies of place: the lived experience of people with dementia in changing social, physical and technological environments. Sociol. Health Illness. https://doi.org/10.1111/j.1467-9566.2009.01203.x.

Brorsson, A., Öhman, A., Lundberg, S., Cutchin, M.P., Nygård, L., 2018. How accessible are grocery shops for people with dementia? A qualitative study using photo documentation and focus group interviews. Dementia. https://doi.org/10.1177/1471301218808591.

Brorsson, A., Öhman, A., Lundberg, S., Nygård, L., 2016. Being a pedestrian with dementia: a qualitative study using photo documentation and focus group interviews. Dementia. https://doi.org/10.1177/1471301214555406.

Brorsson, A., Öhman, A., Lundberg, S., Nygård, L., 2011. Accessibility in public space as perceived by people with Alzheimer's disease. Dementia. https://doi.org/10.1177/1471301211415314.

Buffel, T., Phillipson, C., scharf, T., 2012. Ageing in urban environments: developing "age-friendly" cities. Crit. Soc. Pol. https://doi.org/10.1177/0261018311430457.

Calkins, M., 2018. From research to application: supportive and therapeutic environments for people living with dementia. Gerontol. https://doi.org/10.1093/geront/gnx146.

Chaudhury, H., Cooke, H.A., Cowie, H., Razaghi, L., 2018. The influence of the physical environment on residents with dementia in long-term care settings: a review of the empirical literature. Gerontol. https://doi.org/10.1093/geront/gnw259.

Clare, L., Wu, Y.T., Jones, I.R., Victor, C.R., Nelis, S.M., Martyr, A., Quinn, C., Litherland, R., Pickett, J.A., Hindle, J.V., Jones, R.W., Knapp, M., Kopelman, M.D., Morris, R.G., Rusted, J.M., Thom, J.M., Lamont, R.A., Henderson, C., Rippon, I., Hillman, A., Matthews, F.E., 2019. A comprehensive model of factors associated with capability to "live well" for family caregivers of people living with mild-to-moderate dementia: findings from the ideal study. Alzheimer Dis. Assoc. Disord. https://doi.org/10.1097/WAD.0000000000000286.

Clark, A., Campbell, S., Keady, J., Kullberg, A., Manji, K., Rummery, K., Ward, R., 2020. Neighbourhoods as relational places for people living with dementia. Soc. Sci. Med. 112927 https://doi.org/10.1016/J.SOCSCIMED.2020.112927.

Clarke, C., Woods, B., Moniz-Cook, E., Mountain, G., Øksnebjerg, L., Chattat, R., Diaz, A., Gove, D., Vernooij-Dassen, M., Wolverson, E., 2020. Measuring the well-being of people with dementia: a conceptual scoping review. Health Qual. Life Outcome. https://doi.org/10.1186/s12955-020-01440-x.

Clarke, C.L., Bailey, C., 2016. Narrative citizenship, resilience and inclusion with dementia: on the inside or on the outside of physical and social places. Dementia 15. https://doi.org/10.1177/1471301216639736.

Cohen-Mansfield, J., Marx, M.S., Thein, K., Dakheel-Ali, M., 2011. The impact of stimuli on affect in persons with dementia. J. Clin. Psychiatr. https://doi.org/10.4088/JCP.09m05694oli.

Courtney-Pratt, H., Mathison, K., Doherty, K., 2018. Distilling authentic community-led strategies to support people with dementia to live well. Community Dev. https://doi.org/10.1080/15575330.2018.1481443.

Cozens, P., Love, T., 2015. A review and current status of crime prevention through environmental design (CPTED). J. Plann. Lit. https://doi.org/10.1177/0885412215595440.

Davis, S., Byers, S., Nay, R., Koch, S., 2009. Guiding design of dementia friendly environments in residential care settings: considering the living experiences. Dementia 8, 185–203. https://doi.org/10.1177/1471301209103250.

Day, K., Carreon, D., Stump, C., 2000. The therapeutic design of environments for people with dementia: a review of the empirical research. Gerontol. https://doi.org/10.1093/geront/40.4.397.

De Witt, L., Ploeg, J., Black, M., 2009. Living on the threshold: the spatial experience of living alone with dementia. Dementia 8, 263–291. https://doi.org/10.1177/1471301209103273.

Dodge, R., Daly, A., Huyton, J., Sanders, L., 2012. The challenge of defining wellbeing. Int. J. Wellbeing. https://doi.org/10.5502/ijw.v2i3.4.

Dröes, R.M., Chattat, R., Diaz, A., Gove, D., Graff, M., Murphy, K., Verbeek, H., Clare, L., Johannessen, A., Roes, M., Verhey, F., Charras, K., Clare, L., Johannessen, A., Roes, M., Verhey, F., Charras, K., 2017. Social health and dementia : a European consensus on the operationalization of the concept and directions for research and practice. Aging Ment. Health 21, 4–17. https://doi.org/10.1080/13607863.2016.1254596.

Dua, T., Seeher, K.M., Sivananthan, S., Chowdhary, N., Pot, A.M., Saxena, S., 2017. World health ORGANIZATION'S global action plan ON the public health response to dementia 2017-2025. Alzheimer's Dement. https://doi.org/10.1016/j.jalz.2017.07.758.

Duggan, S., Blackman, T., Martyr, A., Van Schaik, P., 2008. The impact of early dementia on outdoor life: a "shrinking world"? Dementia 7, 191–204. https://doi.org/10.1177/1471301208091158.

Evans, G.W., 2003. The built environment and mental health. J. Urban Health 80, 536–555. https://doi.org/10.1093/jurban/jtg063.

Førsund, L.H., Grov, E.K., Helvik, A.S., Juvet, L.K., Skovdahl, K., Eriksen, S., 2018. The experience of lived space in persons with dementia: a systematic meta-synthesis. BMC Geriatr. https://doi.org/10.1186/s12877-018-0728-0.

Frank, L.D., Engelke, P., 2005. Multiple impacts of the built environment on public health: walkable places and the exposure to air pollution. Int. Reg. Sci. Rev. https://doi.org/10.1177/0160017604273853.

Gaber, S.N., Nygård, L., Brorsson, A., Kottorp, A., Malinowsky, C., 2019. Everyday technologies and public space participation among people with and without dementia. Can. J. Occup. Ther. https://doi.org/10.1177/0008417419837764.

Garvelink, M.M., Emond, J., Menear, M., Brière, N., Freitas, A., Boland, L., Perez, M.M.B., Blair, L., Stacey, D., Légaré, F., 2016. Development of a decision guide to support the elderly in decision making about location of care: an iterative, user-centered design. Res. Involv. Engagem. https://doi.org/10.1186/s40900-016-0040-0.

Gibson, G., Chalfont, G.E., Clarke, P.D., Torrington, J.M., Sixsmith, A.J., 2013. Housing and connection to nature for people with dementia: findings from the INDEPENDENT project. In: Outdoor Environments for People with Dementia. https://doi.org/10.1300/J081v21n01_04.

Green, J., Thorogood, N., 2004. Qualitative methodology and health research. In: Qualitative Methods for Health Research.

Hadjri, K., Rooney, C., Faith, V., 2015. Housing choices and care home design for people with dementia. Heal. Environ. Res. Des. J. 8, 80–95. https://doi.org/10.1177/1937586715573740.

Han, A., Radel, J., McDowd, J.M., Sabata, D., 2016. Perspectives of people with dementia about meaningful activities. Am. J. Alzheimers. Dis. Other Demen. https://doi.org/10.1177/1533317515598857.

Hanson, H.M., Schiller, C., Winters, M., Sims-Gould, J., Clarke, P., Curran, E., Donaldson, M.G., Pitman, B., Scott, V., McKay, H.A., Ashe, M.C., 2013. Concept mapping applied to the intersection between older adults' outdoor walking and the built and social environments. Prev. Med. (Baltim). https://doi.org/10.1016/j.ypmed.2013.08.023.

Hebert, C.A., Scales, K., 2017. Dementia friendly initiatives: a state of the science review. Dementia, 147130121773143. https://doi.org/10.1177/1471301217731433.

Hellström, I., Nolan, M., Nordenfelt, L., Lundh, U., 2007. Ethical and methodological issues in interviewing persons with dementia. Nurs. Ethics 14, 608–619. https://doi.org/10.1177/0969733007080206.

Kabisch, N., van den Bosch, M., Lafortezza, R., 2017. The health benefits of nature-based solutions to urbanization challenges for children and the elderly – a systematic review. Environ. Res. https://doi.org/10.1016/j.envres.2017.08.004.

Keady, J., Campbell, S., Barnes, H., Ward, R., Li, X., Swarbrick, C., Burrow, S., Elvish, R., 2012. Neighbourhoods and dementia in the health and social care context: a realist review of the literature and implications for UK policy development. Rev. Clin. Gerontol. 22, 150–163. https://doi.org/10.1017/S0959259811000268.

Keating, N., Phillips, J., 2008. A critical human ecology perspective on rural ageing. In: Rural Ageing: A Good Place to Grow Old?. https://doi.org/10.2307/j.ctt9qgmzc.6.

Koster, A., Bosma, H., Broese van Groenou, M.I., Kempen, G.I., Penninx, B.W., van Eijk, J. T., Deeg, D.J., 2006. Explanations of socioeconomic differences in changes in

physical function in older adults: results from the Longitudinal Aging Study Amsterdam. BMC Publ. Health 6, 244. https://doi.org/10.1186/1471-2458-6-244.
Levac, D., Colquhoun, H., O'Brien, K.K., 2010. Scoping studies: advancing the methodology. Implement. Sci. https://doi.org/10.1186/1748-5908-5-69.
Lin, S.Y., Lewis, F.M., 2015. Dementia friendly, dementia capable, and dementia positive: concepts to prepare for the future. Gerontol. https://doi.org/10.1093/geront/gnu122.
Lindqvist, E., Perssonvasiliou, A., Hwang, A.S., Mihailidis, A., Astelle, A., Sixsmith, A., Nygård, L., 2018. The contrasting role of technology as both supportive and hindering in the everyday lives of people with mild cognitive deficits: a focus group study. BMC Geriatr. https://doi.org/10.1186/s12877-018-0879-z.
Lloyd, B.T., Stirling, C., 2015. The will to mobility: life-space satisfaction and distress in people with dementia who live alone. Ageing Soc. https://doi.org/10.1017/S0144686X14000683.
Macdonald, A., Cooper, B., 2007. Long-term care and dementia services: an impending crisis. Age Ageing. https://doi.org/10.1093/ageing/afl126.
Michalowsky, B., Eichler, T., Thyrian, J.R., Hertel, J., Wucherer, D., Hoffmann, W., Flessa, S., 2016. Healthcare resource utilization and cost in dementia: are there differences between patients screened positive for dementia with and those without a formal diagnosis of dementia in primary care in Germany? Int. Psychogeriatr. 28, 359–369. https://doi.org/10.1017/S1041610215001453.
Mitchell, L., Burton, E., 2010. Designing dementia-friendly neighbourhoods: helping people with dementia to get out and about. J. Integrated Care 18, 11–18. https://doi.org/10.5042/jic.2010.0647.
Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., 2009. Systematic reviews and meta-analyses: the PRISMA statement. Ann. Intern. Med. 151, 264–269. https://doi.org/10.1371/journal.pmed1000097.
Morrisby, C., Joosten, A., Ciccarelli, M., 2018. Do services meet the needs of people with dementia and carers living in the community? A scoping review of the international literature. Int. psychogeriatrics 30, 5–14. https://doi.org/10.1017/S1041610217001491.
Motealleh, P., Moyle, W., Jones, C., Dupre, K., 2019. Creating a dementia-friendly environment through the use of outdoor natural landscape design intervention in long-term care facilities: a narrative review. Heal. Place. https://doi.org/10.1016/j.healthplace.2019.102148.
Mouratidis, K., 2018. Built environment and social well-being: how does urban form affect social life and personal relationships? Cities. https://doi.org/10.1016/j.cities.2017.10.020.
Novek, S., Wilkinson, H., 2017. Safe and inclusive research practices for qualitative research involving people with dementia: a review of key issues and strategies. Dementia, 1471301217701274. https://doi.org/10.1177/1471301217701274.
Nygård, L., 2008. The meaning of everyday technology as experienced by people with dementia who live alone. Dementia 7, 481–502. https://doi.org/10.1177/1471301208096631.
Odzakovic, E., Hellström, I., Ward, R., Kullberg, A., 2018. 'Overjoyed that I can go outside': using walking interviews to learn about the lived experience and meaning of neighbourhood for people living with dementia. Dementia. https://doi.org/10.1177/1471301218817453.
Odzakovic, E., Kullberg, A., Hellström, I., Clark, A., Campbell, S., Manji, K., Rummery, K., Keady, J., Ward, R., 2019. "It's our pleasure, we count cars here": an exploration of the "neighbourhood-based connections" for people living alone with dementia. Ageing Soc. https://doi.org/10.1017/S0144686X19001259.
Öhman, A., Josephsson, S., Nygård, L., 2008. Awareness through interaction in everyday occupations: experiences of people with Alzheimer's disease. Scand. J. Occup. Ther. https://doi.org/10.1080/11038120701441080.
Olsson, A., Lampic, C., Skovdahl, K., Engström, M., 2013. Persons with early-stage dementia reflect on being outdoors: a repeated interview study. Aging Ment. Health 17, 793–800. https://doi.org/10.1080/13607863.2013.801065.
Ottoni, C.A., Sims-Gould, J., Winters, M., Heijnen, M., McKay, H.A., 2016. "Benches become like porches": built and social environment influences on older adults' experiences of mobility and well-being. Soc. Sci. Med. https://doi.org/10.1016/j.socscimed.2016.08.044.
Peters, M.D.J., Godfrey, C.M., Khalil, H., McInerney, P., Parker, D., Soares, C.B., 2015. Guidance for conducting systematic scoping reviews. Int. J. Evid. Base. Healthc. https://doi.org/10.1097/XEB.0000000000000050.
Prince, M., Bryce, R., Albanese, E., Wimo, A., Ribeiro, W., Ferri, C.P., 2013. The global prevalence of dementia: a systematic review and metaanalysis. Alzheimer's Dementia 9, 63–75. https://doi.org/10.1016/J.JALZ.2012.11.007 e2.
Rahman, S., Swaffer, K., 2018. Assets-based approaches and dementia-friendly communities. Dementia. https://doi.org/10.1177/1471301217751533.
Rapaport, P., Burton, A., Leverton, M., Herat-Gunaratne, R., Beresford-Dent, J., Lord, K., Downs, M., Boex, S., Horsley, R., Giebel, C., Cooper, C., 2020. "I just keep thinking that I don't want to rely on people." a qualitative study of how people living with dementia achieve and maintain independence at home: stakeholder perspectives. BMC Geriatr. https://doi.org/10.1186/s12877-019-1406-6.
Rodgers, P.A., 2018. Co-designing with people living with dementia. CoDesign. https://doi.org/10.1080/15710882.2017.1282527.
Sandberg, L., Rosenberg, L., Sandman, P.O., Borell, L., 2017. Risks in situations that are experienced as unfamiliar and confusing – the perspective of persons with dementia. Dementia. https://doi.org/10.1177/1471301215603836.
Seetharaman, K., Shepley, M.M., Cheairs, C., 2020. The saliency of geographical landmarks for community navigation: a photovoice study with persons living with dementia. Dementia. https://doi.org/10.1177/1471301220927236.
Shah, H., Albanese, E., Duggan, C., Rudan, I., Langa, K.M., Carrillo, M.C., Chan, K.Y., Joanette, Y., Prince, M., Rossor, M., Saxena, S., Snyder, H.M., Sperling, R., Varghese, M., Wang, H., Wortmann, M., Dua, T., 2016. Research priorities to reduce the global burden of dementia by 2025. Lancet Neurol. https://doi.org/10.1016/S1474-4422(16)30235-6.
Sheehan, B., Burton, E., Mitchell, L., 2006. Outdoor wayfinding in dementia. Dementia 5, 271–281. https://doi.org/10.1177/1471301206062254.
Smith, K., Gee, S., Sharrock, T., Croucher, M., 2016. Developing a dementia-friendly Christchurch: perspectives of people with dementia. Australas. J. Ageing 35, 188–192. https://doi.org/10.1111/ajag.12287.
Soilemezi, D., Drahota, A., Crossland, J., Stores, R., 2019. The role of the home environment in dementia care and support: systematic review of qualitative research. Dementia. https://doi.org/10.1177/1471301217692130.
Span, M., Hettinga, M., Vernooij-Dassen, M., Eefsting, J., Smits, C., 2013. Involving people with dementia in the development of supportive IT applications: a systematic review. Ageing Res. Rev. 12, 535–551. https://doi.org/10.1016/j.arr.2013.01.002.
Sturge, J., Klaassens, M., Lager, D., Weitkamp, G., Vegter, D., Meijering, L., 2020. Using the concept of activity space to understand the social health of older adults living with memory problems and dementia at home. Soc. Sci. Med. https://doi.org/10.1016/j.socscimed.2020.113208.
Tranvåg, O., Petersen, K.A., Nåden, D., 2015. Relational interactions preserving dignity experience: perceptions of persons living with dementia. Nurs. Ethics. https://doi.org/10.1177/0969733014549882.
Tricco, A.C., Lillie, E., Zarin, W., O'Brien, K.K., Colquhoun, H., Levac, D., Moher, D., Peters, M.D.J., Horsley, T., Weeks, L., Hempel, S., Akl, E.A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M.G., Garritty, C., Lewin, S., Godfrey, C.M., MacDonald, M.T., Langlois, E.V., Soares-Weiser, K., Moriarty, J., Clifford, T., Tunçalp, Ö., Straus, S.E., 2018. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann. Intern. Med. https://doi.org/10.7326/M18-0850.
Tsekleves, E., Bingley, A.F., Luján Escalante, M.A., Gradinar, A., 2020. Engaging people with dementia in designing playful and creative practices: Co-design or co-creation? Dementia. https://doi.org/10.1177/1471301218791692.
van der Roest, H.G., Meiland, F.J.M., Comijs, H.C., Derksen, E., Jansen, A.P.D., van Hout, H.P.J., Jonker, C., Dröes, R.-M., 2009. What do community-dwelling people with dementia need? A survey of those who are known to care and welfare services. Int. Psychogeriatr. 21, 949. https://doi.org/10.1017/S1041610209990147.
van Hoof, J., 2010. Ageing-in-place: the integrated design of housing facilities for people with dementia. Tech. Univ. Eindhoven 1–293. https://doi.org/10.6100/IR685914.
van Hoof, J., Sprong, M., Marston, H., Janssen, B., van Hoof, M.R., Marston, H.R., Janssen, B.M., 2015. The use of mood boards to study housing needs of nursing home residents with dementia. Int. J. Innov. Res. Sci. Technol.
Vernooij-Dassen, M., Jeon, Y.-H., 2016. Social health and dementia: the power of human capabilities. Int. Psychogeriatr. 28, 701–703. https://doi.org/10.1017/S1041610216000260.
Ward, R., Clark, A., Campbell, S., Graham, B., Kullberg, A., Manji, K., Rummery, K., Keady, J., 2018. The lived neighborhood: understanding how people with dementia engage with their local environment. Int. Psychogeriatr. 30, 867–880. https://doi.org/10.1017/S1041610217000631.
WHO, 2018. WHO | 10 Facts on Dementia. Who. https://www.who.int/news-room/fact-sheets/detail/dementia.
Wiersma, E.C., Denton, A., 2016. From social network to safety net: dementia-friendly communities in rural northern Ontario. Dementia. https://doi.org/10.1177/1471301213516118.
Wiersma, E.C., O'Connor, D.L., Loiselle, L., Hickman, K., Heibein, B., Hounam, B., Mann, J., 2016. Creating space for citizenship: the impact of group structure on validating the voices of people with dementia. Dementia. https://doi.org/10.1177/1471301216642339.
Wiles, J.L., Leibing, A., Guberman, N., Reeve, J., Allen, R.E.S., 2012. The meaning of "aging in place" to older people. Gerontol. https://doi.org/10.1093/geront/gnr098.
Wu, S.M., Huang, H.L., Chiu, Y.C., Tang, L.Y., Yang, P.S., Hsu, J.L., Liu, C.L., Wang, W.S., Shyu, Y.I.L., 2019. Dementia-friendly community indicators from the perspectives of people living with dementia and dementia-family caregivers. J. Adv. Nurs. https://doi.org/10.1111/jan.14123.